Gunsight-Humbug Ridge Siskiyou Mariposa Lily Integrated Pest Management Project Proposal

Salmon-Scott River Ranger District, Klamath National Forest

Background

The Salmon-Scott River Ranger District proposes the Gunsight-Humbug Ridge Siskiyou Mariposa Lily Integrated Pest Management Project to remove dyer's woad (*Isatis tinctoria,* also known as Marlahan mustard) from Siskiyou mariposa lily (*Calochortus persistens*) habitat on Gunsight-Humbug Ridge and surrounding hillsides. Competition with dyer's woad has been identified as the most significant and chronic threat to the continued survival of the Siskiyou mariposa lily, a Forest Service and Bureau of Land Management sensitive species, and State of California rare species.

The project is located on Gunsight-Humbug Ridge in the eastern Scott Bar Mountains of Siskiyou County, California within the Humbug-Klamath River, Yreka Creek-Shasta River, and Moffett Creek watersheds. The project area is about three air miles west and slightly north of Yreka: Township 45 North, Range 7 West, Sections 17 to 20; and Township 45 North, Range 8 West, Sections 13 to 17, and 20 to 24; Mount Diablo Meridian. The project area encompasses about 8,380 acres, with 6,980 acres occurring on National Forest System lands and 1,406 acres on private land (approximately 30 individual landowners). These private inholdings do represent a potential seed source for continued invasion. The County does assist with treatment on private land where infestations threaten the Siskiyou mariposa lily. On other private inholdings, noxious weed treatments vary by individual land owner. Project activities are proposed on about 5,566 acres on National Forest System lands within the project boundary. Elevation ranges from 3,200 to 6,200 feet. Vicinity and project maps are enclosed.

The project boundary includes the 1000-acre Siskiyou Mariposa Lily Management Area. This special management area was designated to provide for a viable population of Siskiyou mariposa lily and prevent a trend towards federal listing under the Endangered Species Act. Siskiyou mariposa lily plants occur in rocky openings within a montane shrub plant community; typically in areas that have minimal competition from other species. Surrounding this open, shrubby community where the Siskiyou mariposa lily occurs, is mixed coniferous forest. Soils on Gunsight-Humbug Ridge are gravelly loams (composed of clay, silt, and sand) formed from metamorphic parent material.

Management Direction

The 1995 Klamath National Forest Land and Resource Management Plan (Forest Plan, as amended) includes Standards and Guidelines from the Northwest Forest Plan. The Forest Plan provides forest-wide and management area (MA) direction for project-level planning. Management area goals from the Forest Plan which are pertinent to this project are presented below in Table 1. In addition to Forest Plan direction, the interdisciplinary team (IDT) considered guidance and conservation actions provided in the Conservation Agreement between the U.S. Fish and Wildlife Service, U.S. Forest Service, and U.S. Bureau of Land Management for Siskiyou mariposa lily.

Table 1. Management areas and applicable direction for the proposed project area.

Management Area (MA)	Acres in Project Area	Acres Proposed for Treatment	Management Area Goals Pertinent to this Project

Management Area (MA)	Acres in Project Area	Acres Proposed for Treatment	Management Area Goals Pertinent to this Project
MA 5 – *Calochortus persistens* Special Habitat	1,000	1,000	Reduce or eliminate invasive, non-native weedy plant species that compete with *Calochortus persistens* for water, space and nutrients (Forest Plan pg. 4-111). Disturbed areas near this habitat should be managed to exclude non-native invasive plant species (MA5-77). Implement weed removal treatments along roads, in fuel breaks, around communication sites, and in other areas adjacent to existing *Calochortus persistens* populations in order to reduce the invasion pressure of weeds on the habitat (Conservation Agreement, pg. 21).
MA 10 Riparian Reserves	1,402	0	No project activities will occur within this management area.
MA 15 Partial Retention Visual Quality	1,570	1,556	There are no Standards and Guidelines for this management area that apply to proposed activities.
MA 17 General Forest	3,002	2,999	There are no Standards and Guidelines for this management area that apply to proposed activities.

Purpose and Need for Action

The purpose and need for this project is to:

- Reduce or eliminate invasive non-native plant species that compete with Siskiyou Mariposa lily for water, space, and nutrients and are thought to represent the most significant and chronic threat to the survival of this species by implementing actions which are effective, practical, and cost-efficient.

Existing Condition

Dyer's woad infestations are widespread throughout the project area. Intensive manual removal efforts within occupied habitat in the Siskiyou Mariposa Lily Management Area have been ongoing since 2003. While these effort have been successful in reducing the total number of infested acres within occupied habitat in the Siskiyou Mariposa Lily Management Area, to date we are able to effectively treat only 130 acres annually of 1,000-acre management area using manual methods. Infestation on surrounding hillsides outside of the management area have continued to spread unabated, creating a renewable seed source for spread into these regularly treated areas. The continual encroachment of infestations up the hill slope requires yearly treatment in order to meet Conservation Agreement standards and prevent the Siskiyou mariposa lily from trending towards Federal listing. Current manual treatments, although effective within the Siskiyou Mariposa Lily Management Area, are expensive, time intensive, and unsustainable in the long-term. Additionally, a goal of this project is to extend our treatment area to

surrounding hillsides in order to create a more effective buffer to protect the Siskiyou mariposa lily from trending towards federal listing, something we are unable to do using manual treatment methods.

Figure 1. Habitat and flowers of the Siskiyou mariposa lily (left and right).

Figure 2. Dyer's woad infestation along Gunsight-Humbug Ridge.

Desired Condition

The desired condition is to accomplish the Conservation Agreement management objective to reduce or eliminate existing threats to Siskiyou Mariposa Lily and restore its habitat so that population levels can be maintained or increased. The desired condition includes an integrated approach to invasive species control using practical, cost-effective, tools. Finally, the ultimate desired condition is to reduce the infestation to a level that can be controlled by Forest staff as part of the normal Forest Noxious Weed Treatment and Monitoring Program (1-5 days for a 2 person crew) and to create a continually decreasing trend in total acreage infested by noxious weeds.

Proposed Action

The proposed action was designed to meet the purpose and need of the project. The proposed action would treat infestations on 5,566 acres within the 8,380-acre project boundary. A conservative estimate of infested acres within the 5,566 –acre treatment area would be about 10%, or 560 infested acres scattered throughout the treatment area. Not all 560 infested acres would be treated each year. Annual treatments would first focus on the management area and then work outwards as infestation density is reduced. It is anticipated that about 100 acres would be surveyed each year with only about 10 acres actually receiving treatment.

Proposed weed removal treatments include: (1) hand pulling, (2) weed whacking, (3) biocontrol (dyer's woad rust), (4) spot spraying of herbicide using a backpack sprayer, and (5) wicking of herbicide (a sponge or other absorbent material attached to an herbicide reservoir used for directed application). Chemical treatment is not proposed in Riparian Reserves; any infestations occurring in Riparian Reserves would be treated using manual methods.

Manual treatments would consist of hand pulling and weed whacking. Hand pulling would be conducted using weed bars (a specialized tool for removing plants with a taproot). The pointed end of the weed bar is inserted into the ground at the top of the root crown and used to loosen the soil around the root so it can be pulled out. These tools were developed to minimize ground disturbance. Weed whackers and shears would be used to sever the flowering or seed heads from the plant and prevent seed set.

Biological control agents are natural predators, parasites, or pathogens that are used to substantially reduce the abundance and fecundity of their specific target invasive species. Biological control treatments would be conducted using the dyer's woad rust, *Puccina thlaspeos.* This biological control agent has undergone many years of research which demonstrates its high level of specificity to the target host, dyer's woad. Dyer's woad rust is currently in the final stages of approval by Animal and Plant Health Inspection Service (APHIS) and California Department of Food and Agriculture (CDFA) and would not be used unless it is officially approved and released for use within California. Other biological control agents may be used following final approval by APHIS and CDFA.

Chemical treatment would be conducted once per year using the herbicides Chlorsulfuron, trade name Telar, mixed with an amine formulation of 2,4-D. Herbicides would be combined in order to reduce the risk of dyer's woad developing resistance to any individual active ingredient. Herbicides would also be combined with a surfactant (an agent used to disperse the herbicide for proper adhesion and absorption) and possibly a colorant (dye). Chlorsulfuron and 2,4-D are both systematic herbicides that can be used to control invasive and noxious broadleaf weeds. They have mixed selectivity, but are generally considered safe on grasses.

Herbicide application would primarily be employed before the dyer's woad flowering period, during the months of April and May. Herbicide applied in the rosette stage of development (i.e., to the basal leaves before bolting of the flower stalk occurs) is more effective in killing the tap root than it would be later the plant's growth period. Plants may be sprayed at a later date, if necessary, in order to prevent seed set. Use of spot spraying and wick application methods would allow herbicide to be directly applied to target plants without impacting desirable vegetation and other non-target organisms. Treatments would focus on plant-specific applications and would not include broad-scale application techniques. Herbicides would only be applied by trained or certified applicators in accordance with label instructions and applicable federal and state pesticide laws and Forest Service policies. Label instructions including constraints on application under certain wind, temperature, precipitation, and other weather conditions in order to eliminate drift, volatilization, leaching, and runoff would be followed

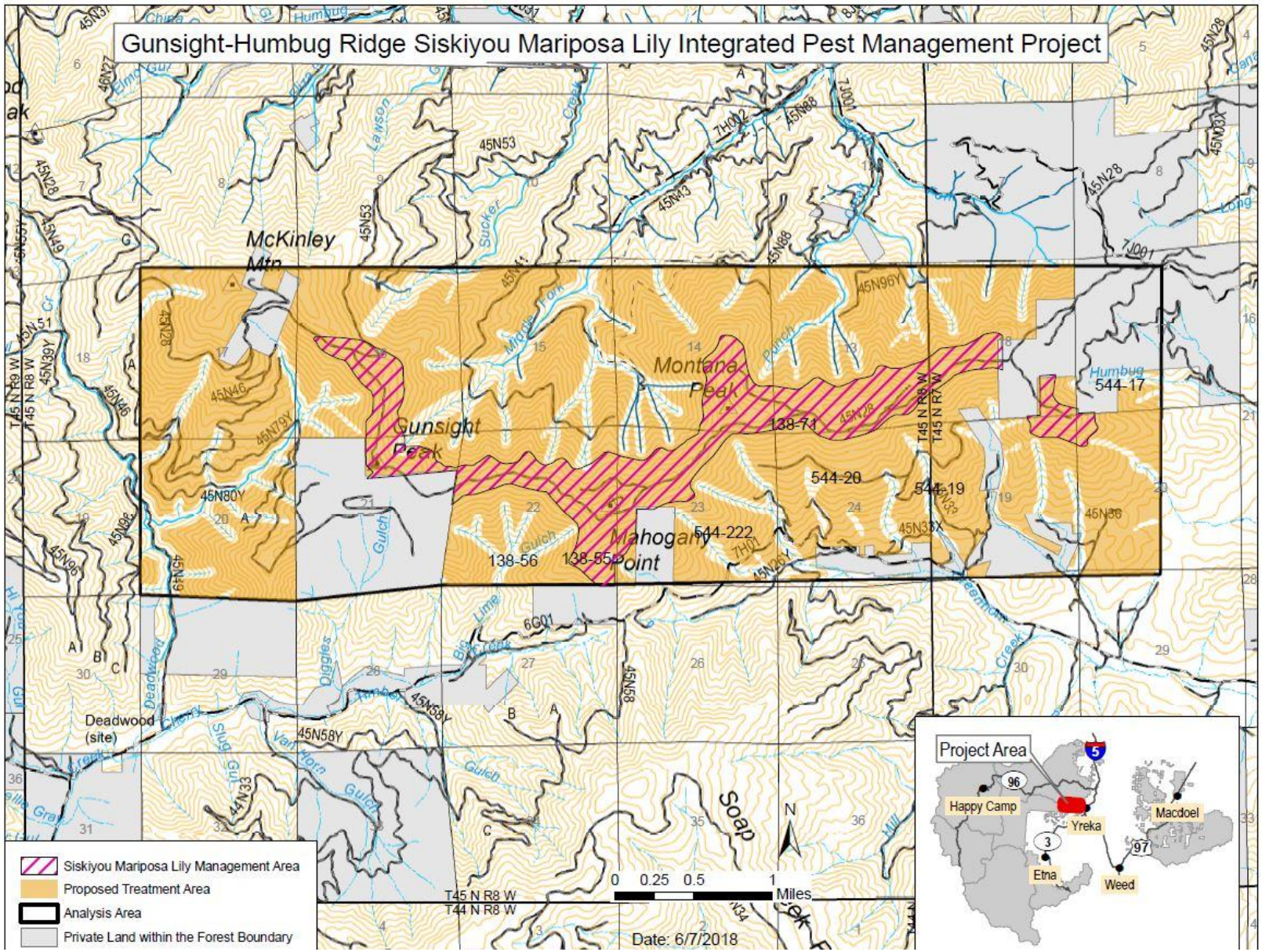

Figure 1. Project Area Map